

# Carbon Nanotube (CNT) and Carbon Fiber Reinforced SiC Optical Components, Phase I

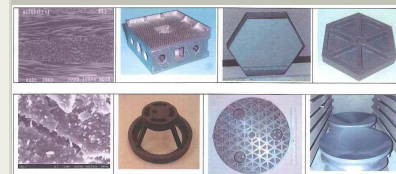
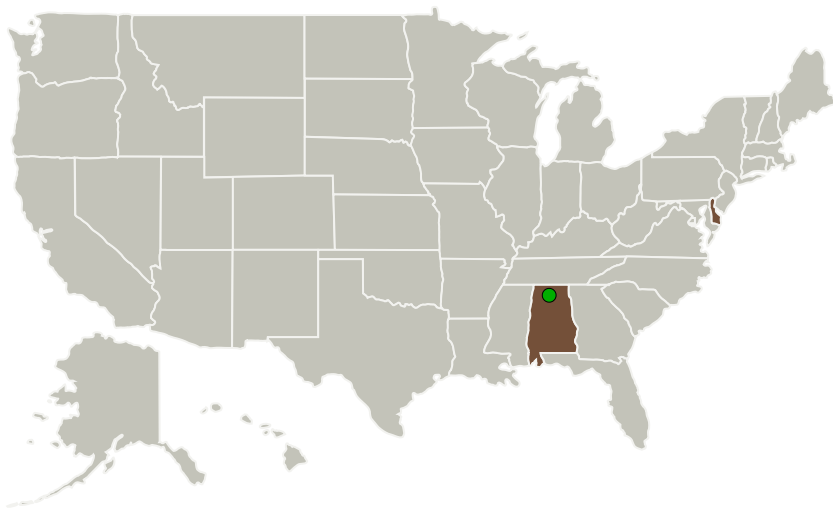
Completed Technology Project (2012 - 2012)



## Project Introduction

M Cubed has developed and patented technology to make carbon fiber reinforced SiC composites and components. In addition, the feasibility of doubling the toughness of SiC with carbon nanotube (CNT) reinforcement has been proven. In this program, M Cubed will demonstrate further innovative modifications of the above technology to make extremely lightweight, high toughness, low CTE optical components. In particular, 0.25 m and 0.5m lightweighted spherical mirror substrates will be fabricated, coated, finished and delivered to NASA for characterization (including cryogenic testing. A path will be outlined to take the technology to 1-2m class mirror in Phase II.

## Primary U.S. Work Locations and Key Partners



Carbon Nanotube (CNT) and Carbon Fiber Reinforced SiC Optical Components Project Image

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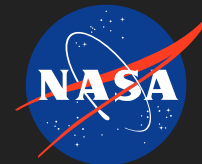
Organizations Performing Work	Role	Type	Location
M Cubed Technologies, Inc.	Lead Organization	Industry	Newark, Delaware
● Marshall Space Flight Center (MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

## Primary U.S. Work Locations

Alabama	Delaware
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## Project Transitions

 **February 2012:** Project Start

 **August 2012:** Closed out

### Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138027>)

## Images



### Primary Image

Carbon Nanotube (CNT) and Carbon Fiber Reinforced SiC Optical Components Project Image  
(<https://techport.nasa.gov/image/135874>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

M Cubed Technologies, Inc.

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

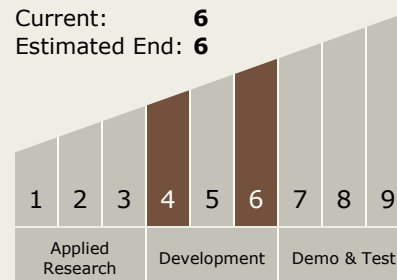
Carlos Torrez

### Principal Investigator:

Prashant Karandikar

## Technology Maturity (TRL)

Start: 4  
Current: 6  
Estimated End: 6



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## Technology Areas

### Primary:

- TX08 Sensors and Instruments
  - └ TX08.1 Remote Sensing Instruments/Sensors
    - └ TX08.1.3 Optical Components

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System